



Standard optical

Sendix 5853 / 5873 (shaft / hollow shaft)

SSI / BiSS + incremental



The Sendix 5853 and Sendix 5873 singleturn encoders with optical sensor technology can achieve a resolution of max. 21 bits.

Easy integration in the application thanks to the BiSS interface, with electronic data sheet.

This series offers special versions for use on direct drives for the lift technology.































Temperature

High protection

capacity

resistant

Magnetic field proof

Short-circuit proof

Reverse polarity protection

Reliable and insensitive

- Sturdy bearing construction in Safety-Lock™ design for resistance against vibration and installation errors.
- · Ideal for use outdoors thanks to IP67 protection and wide temperature range from -40 °C up to +90 °C.

Versatile

- High-precision with a data refresh rate of the position value $\leq 1 \mu s$.
- · High-resolution feedback in real-time via 21 bit fully digital or incremental outputs SinCos and RS422.
- · BiSS-C BP3 encoder profile.
- · Short control cycles, clock rate with SSI up to 2 MHz / with BiSS up to 10 MHz.

Order code **Shaft version**

8.5853

□ 63.5 mm [2.5"]







O Flange

1 = clamping flange, IP65 ø 58 mm [2.28"]

3 = clamping flange, IP67 ø 58 mm [2.28"]

2 = synchro flange, IP65 ø 58 mm [2.28"]

4 = synchro flange, IP67 ø 58 mm [2.28"]

5 = square flange, IP65 □ 63.5 mm [2.5"]

7 = square flange, IP67

Shaft (ø x L), with flat 1 = 6 x 10 mm [0.24 x 0.39"] 1)

2 = 10 x 20 mm [0.39 x 0.79"] 2)

3 = 1/4" x 7/8"

4 = 3/8" x 7/8"

Interface / supply voltage

1 = SSI, BiSS / 5 V DC

2 = SSI, BiSS / 10 ... 30 V DC

3 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC

4 = SSI, BiSS + 2048 ppr. SinCos / 10 ... 30 V DC 5 = SSI, BiSS / 5 V DC, with sensor output

6 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC, with sensor output

7 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC

8 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 10 ... 30 V DC

9 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC, with sensor output

Type of connection

1 = axial cable, 1 m [3.28'] PVC

A = axial cable, special length PVC *)

2 = radial cable, 1 m [3.28'] PVC

B = radial cable, special length PVC *)

3 = axial M23 connector, 12-pin 4 = radial M23 connector, 12-pin

5 = axial M12 connector, 8-pin 3)

6 = radial M12 connector, 8-pin 3)

Available special lengths (connection types A, B): 2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.5853.112A.G323.0030 (for cable length 3 m)

Code

B = SSI, binary

C = BiSS, binary G = SSI, gray

Resolution 4)

A = 10 bit

1 = 11 bit

2 = 12 bit

3 = 13 bit

4 = 14 bit

7 = 17 bit

9 = 19 bitC = 21 bit 5) Options (service)

1 = no option

2 = status LED

3 = SET button and status LED

Optional on request

- Fx 2/22 6)

- surface protection salt spray tested

- other resolutions

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- 4) Resolution, preset value and counting direction factory-programmable.
- 5) Only in conjunction with interface 1 or 2.
- 6) For the cable connection type, cable material PUR.

¹⁾ Preferred type only in conjunction with flange type 2.

Preferred type only in conjunction with flange type 1.

³⁾ Can be combined only with interface 1 and 2



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Hollow shaft

Order code

8.5873 | . |X|X|X|X| . |X|X|2|X 0000 00

a Flange

1 = with spring element, long, IP65

2 = with spring element, long, IP67

3 = with stator coupling, IP65 ø 65 mm [2.56"]

4 = with stator coupling, IP67 ø 65 mm [2.56"]

5 = with stator coupling, IP65 ø 63 mm [2.48"]

6 = with stator coupling, IP67 Ø 63 mm [2.48"]

G = with stator coupling, IP65 ø 72 mm [2.83"] $^{1)}$

H = with expanding coupling, IP65 ø 65 mm [2.56"] 1)

Through hollow shaft

 $3 = \emptyset 10 \text{ mm } [0.39"]$

4 = ø 12 mm [0.47"]

5 = Ø 14 mm [0.55"]

6 = Ø 15 mm [0.59"]

 $8 = \emptyset 3/8"$

9 = 0 1/2"

Tapered shaft

 $K = \emptyset 10 \text{ mm} [0.39"]$

Interface / supply voltage

1 = SSI, BiSS / 5 V DC

2 = SSI, BiSS / 10 ... 30 V DC

3 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC

4 = SSI, BiSS + 2048 ppr. SinCos / 10 ... 30 V DC

5 = SSI, BiSS / 5 V DC, with sensor output

6 = SSI, BiSS + 2048 ppr. SinCos / 5 V DC, with sensor output

7 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC

8 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 10 ... 30 V DC

9 = SSI, BiSS + 2048 ppr. RS422 (TTL-comp.) / 5 V DC, with sensor output

Type of connection

2 = radial cable, 1 m [3.28'] PVC

B = radial cable, special length PVC *)

E = tangential cable, 1 m [3.28'] PVC

F = tangential cable, special length PVC *)

4 = radial M23 connector, 12-pin

6 = radial M12 connector, 8-pin 2)

*) Available special lengths (connection types B, F): 2, 3, 5, 8, 10, 15 m [5.56, 9.84, 16.40, 26.25, 32.80, 49.21'] order code expansion .XXXX = length in dm ex.: 8.5873.542B.G323.0030 (for cable length 3 m)

Code

B = SSI, binary

C = BiSS, binary

G = SSI, gray

Resolution 3)

A = 10 bit

1 = 11 bit

2 = 12 bit 3 = 13 bit

4 = 14 bit

7 = 17 bit

9 = 19 bit $C = 21 \text{ bit } ^{4)}$ Optional on request

1 = no option

2 = status LED

Options (service)

- Ex 2/22 (not with type of connection E or F) 5

8.0010.4700.0000

- surface protection salt spray tested

3 = SET button and status LED

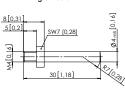
- other resolutions

Mounting accessory for shaft encoders		Order no.
Coupling	bellows coupling ø 19 mm [0.75"] for shaft 6 mm [0.24"] bellows coupling ø 19 mm [0.75"] for shaft 10 mm [0.39"]	8.0000.1102.0606 8.0000.1102.1010
Mounting accessory	for hollow shaft encoders Dimensions in mm [inch]	Order no.

Torque pin, ø 4 mm

for flange with spring element

(flange type 1)



with fixing thread

,	SW7 [0,28]

VVILII	ixing till cad	
8[0,31 5[0,2]	SW7 [0,28]	Ø4m8 [0,16]
M4 0.16	30[1,18]	P.Z.(0, 20)
		•

Cables and connectors		Order no.
Preassembled cables	M12 female connector with coupling nut, 8-pin, A coded, straight single-ended 2 m [6.56'] PVC cable M23 female connector with coupling nut, 12-pin, cw single-ended 2 m [6.56'] PVC cable	05.00.6041.8211.002M 8.0000.6901.0002.0031
Connectors	M12 female connector with coupling nut, 8-pin, A coded, straight (metal) M23 female connector with coupling nut, 12-pin, cw	05.CMB 8181-0 8.0000.5012.0000

Further Kübler accessories can be found at: kuebler.com/accessories

Further Kübler cables and connectors can be found at: kuebler.com/connection-technology

¹⁾ Can be combined only with shaft K and type of connection E or F.

²⁾ Can be combined only with interface 1 and 2. Resolution, preset value and counting direction factory-programmable.

⁴⁾ Only in conjunction with interface 1 or 2.

⁵⁾ For the cable connection type, cable material PUR.



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Technical data

Mechanical	characteristics	
Maximum spee	d shaft version	
	IP65 up to 70 °C [158 °F]	12000 min ⁻¹ , 10000 min ⁻¹ (continuous)
	IP65 up to Tmax	8000 min ⁻¹ , 5000 min ⁻¹ (continuous)
	IP67 up to 70 °C [158 °F]	11000 min ⁻¹ , 9000 min ⁻¹ (continuous)
	IP67 up to Tmax	8000 min ⁻¹ , 5000 min ⁻¹ (continuous)
Maximum spee	d hollow shaft version	
	IP65 up to 70 °C [158 °F]	9000 min ⁻¹ , 6000 min ⁻¹ (continuous)
	IP65 up to Tmax	6000 min ⁻¹ , 3000 min ⁻¹ (continuous)
	IP67 up to 70 °C [158 °F]	8000 min ⁻¹ , 4000 min ⁻¹ (continuous)
	IP67 up to T _{max}	4000 min ⁻¹ , 2000 min ⁻¹ (continuous)
Starting torque	IP65	< 0.01 Nm
at 20 °C [68 °F]	IP67	< 0.05 Nm
Mass moment of	of inertia	
	shaft version	3.0 x 10 ⁻⁶ kgm ²
	hollow shaft version	6.0 x 10 ⁻⁶ kgm ²
Load capacity of	of shaft radial	80 N
, ,	axial	40 N
Weight		approx. 0.35 kg [12.35 oz]
Protection	housing side	IP67
acc. to EN 6052	9 shaft side	IP65, opt. IP67
Working tempe	rature range	-40 °C +90 °C [-40 °F +194 °F] ¹⁾
Materials	shaft/hollow shaft	stainless steel
	flange	aluminum
	housing	zinc die-cast
	cable	PVC (PUR for Ex 2/22)
Shock resistance	ce acc. EN 60068-2-27	2500 m/s ² , 6 ms
Vibration resist	ance acc. EN 60068-2-6	100 m/s ² , 55 2000 Hz

Electrical characteristics		
Supply voltage	5 V DC (+5 %) or 10 30 V DC	
Current consumption (no load) 5 V DC 10 30 V DC	max. 70 mA max. 45 mA	
Reverse polarity protection of the supply voltage	yes	
Short circuit proof outputs	yes ²⁾	

SSI interface		
Output driver		RS485 transceiver type
Permissible load	l / channel	max. +/- 20 mA
Signal level	HIGH	typ. 3.8 V
	LOW at $I_{Load} = 20 \text{ mA}$	typ. 1.3 V
Resolution		10 14 bit; 17, 19 and 21 bit
Code		binary or gray
SSI clock rate		50 kHz 2 MHz
Data refresh rate	•	
	ST resolution ≤ 14 bit	≤ 1 µs
	ST resolution > 14 bit	≤ 4 µs
Monoflop time	<u> </u>	≤ 15 µs

Note: If the clock starts cycling within the monoflop time, a second data transfer starts with the same data. If the clock starts cycling after the monoflop time, the data transfer starts with the new values. The update rate is dependent on the clock speed, data length and monoflop-time.

BiSS inte	rface	
Output drive	er	RS485 transceiver type
Permissible	e load / channel	max. +/- 20 mA
Signal leve	I HIGH	typ. 3.8 V
	LOW at I _{Load} = 20 mA	typ. 1.3 V
Resolution		10 14 bit; 17, 19 and 21 bit
Code		binary
Clock rate		50 kHz 10 MHz
Max. updat	e rate	< 15 µs, depends on the clock rate and the data length
Data refres	h rate	
	ST resolution ≤ 14 bit	≤ 1 µs
	ST resolution > 14 bit	≤ 4 µs
Protocol		BiSS-C BP3 encoder profile
Note: - Bidirectional, factory programmable parameters are: resolution, code, direction, alarms and warnings - CRC data verification - EDS (electronic data sheet)		

Status output and LED		
Output driver		open collector, internal pull up resistor 22 kOhm
Permissible load		max. 20 mA
Signal level	HIGH	+V
	LOW	< 1 V
Active		LOW

The optional LED (red) and the status output serve to display various alarm or error messages. In normal operation the LED is OFF and the status output is HIGH (Open Collector with int. pull-up 22 kOhm).

An active status output (LOW) displays:

- Sensor error, singleturn or multiturn (soiling, glass breakage etc.)
- LED fault (failure or ageing)
- over- or under-temperature

In the SSI mode, the fault indication can only be reset by switching off the supply voltage to the device.

Incremental outputs (A/B)		
	SinCos	RS422 TTL compatible
Max. frequency -3dB	400 kHz	400 kHz
Signal level	1 Vpp (±20 %)	HIGH: min. 2.5 V LOW: max. 0.5 V
Short circuit proof	yes ²⁾	yes ²⁾
Pulse rate	2048 ppr	2048 ppr

¹⁾ Cable version: -30 °C ... +75 °C [-22 °F ... +167 °F].
2) Short circuit to 0 V or to output, one channel at a time, supply voltage correctly applied.



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SET input or SET button		
Input		active HIGH
Input type		comparator
Signal level	HIGH	min: 60 % of +V (supply voltage) max: +V
	LOW	max: 25 % of +V (supply voltage)
Input current		< 0.5 mA
Min. pulse duration (SET)		10 ms
Timeout after SET signal		14 ms

The encoder can be set to zero at any position by means of a HIGH signal on the SET input or by pressing the optional SET button (with a pencil, ball-point pen or similar).

Other preset values can be factory-programmed. The SET input has a signal processing time of approx. 1 ms. Once the SET function has been triggered, the encoder requires an internal processing time of approx. 15 ms before the new position data can be read. During this time the status output is at LOW.

If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

DIR input

Direction input: A HIGH signal switches the direction of rotation from the default cw to ccw. This inverted function can also be factory-programmed. If DIR is changed when the device is already switched on, then this will be interpreted as an error. The status output will switch to LOW.

If this input is not used, it should be connected to 0 V (Encoder ground GND) in order to avoid interferences.

Response time (DIR input) 1 ms

Power-ON

After Power-ON the device requires a time of approx. 150 ms before valid data can be read.

Hot plugging of the encoder should be avoided.

Approvals	
UL compliant in accordance with	File no. E224618
CE compliant in accordance with	
EMC Directive	2014/30/EU
RoHS Directive	2011/65/EU
ATEX Directive	2014/34/EU (for Ex 2/22 variants)



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Terminal assignment

Interface	Type of connection	Features	Cable (isolate unused cores individually before initial start-up)													
1 2	1, 2 1, 2, A, B, E, F SET, DIR, Status	SET DIR Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	Ť
1, 2		Core color:	WH	BN	GN	YE	GY	PK	BU	RD	ВК	-	-	-	shield	
Interface	Type of connection	Features	M23 connecto	or, 12-pir	1											
1, 2	3, 4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	N/C	N/C	Ŧ
1, 2	3, 4	SEI, DIII, Status	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate	unused	cores i	ndividua	lly befo	re initia	l start-ι	ıp)						
5	1, 2, A, B, E, F	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	Ť
5	1, 2, A, D, E, F	sensor output	Core color:	WH	BN	GN	YE	GY	PK	BU	RD	BK	-	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	or, 12-pir	1											
-	0.4	SET, DIR, Status	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Stat	N/C	0 Vsens	+Vsens	Ť
5	3, 4	sensor output	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate unused cores individually before initial start-up)													
0.4.7.0	100055	SET, DIR, SinCos	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Α	Ā	В	B	Ŧ
3, 4, 7, 8	1, 2, A, B, E, F	or incr. RS422	Core color:	WH	BN	GN	YE	GY	PK	BU	RD	ВК	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connecto	or, 12-pir												
0.4.7.0	0.4	SET, DIR, SinCos	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Α	Ā	В	B	Ť
3, 4, 7, 8	3, 4	or incr. RS422	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	Cable (isolate unused cores individually before initial start-up)													
	10105	SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	Α	Ā	В	B	0 Vsens	+Vsens	Ť
6, 9	1, 2, A, B, E, F	sensor output	Core color:	WH	BN	GN	YE	GY	PK	BU	RD	ВК	VT	GY-PK	RD-BU	shield
Interface	Type of connection	Features	M23 connector, 12-pin													
	SinCos o. incr. RS422	Signal:	0 V	+V	C+	C-	D+	D-	Α	Ā	В	B	0 Vsens	+Vsens	Ť	
6, 9	6, 9 3, 4	sensor output	Pin:	1	2	3	4	5	6	7	8	9	10	11	12	PH
Interface	Type of connection	Features	M12 connector, 8-pin													
1.2	E C	CET DID	Signal:	0 V	+V	C+	C-	D+	D-	SET	DIR	Ť				
1, 2	1, 2 5, 6 SE	SET, DIR	Pin:	1	2	3	4	5	6	7	8	PH				

+V: Supply voltage encoder +V DC

0 V: Supply voltage encoder ground GND (0 V)

0 $\mbox{\sc V}_{\mbox{\scriptsize Sens}}$ / +Vsens: Using the sensor outputs of the encoder, the voltage

present can be measured and if necessary increased

accordingly.

C+, C-: D+, D-: A, A: Clock signal

Data signal

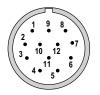
Incremental output channel A (cosine) $B, \overline{B}:$ Incremental output channel B (sine)

SET: Set input DIR: Direction input Stat: Status output

Plug connector housing (shield) PH ±:

Top view of mating side, male contact base





M12 connector, 8-pin

M23 connector, 12-pin



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Dimensions shaft version

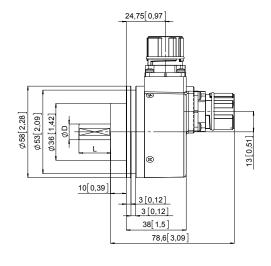
Dimensions in mm [inch]

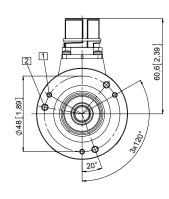
Clamping flange, ø 58 [2.28] Flange type 1 and 3

(drawing with M23 connector)

1 3 x M3, 6 [0.24] deep

2 3 x M4, 8 [0.32] deep





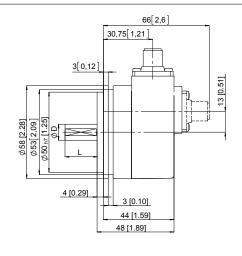
D	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
1/4"	h8	7/8"
3/8"	h8	7/8"

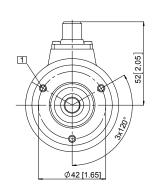
Synchro flange, ø 58 [2.28] Flange type 2 and 4

(drawing with M12 connector)

1 3 x M4, 6 [0.24] deep

D	Fit	L
6 [0.24]	h7	10 [0.39]
10 [0.39]	f7	20 [0.79]
1/4"	h8	7/8"
3/8"	h8	7/8"





Square flange, \square 63.5 [2.5] Flange type 5 and 7

(drawing with cable)

D

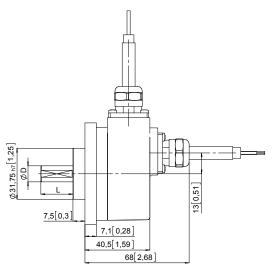
6 [0.24]

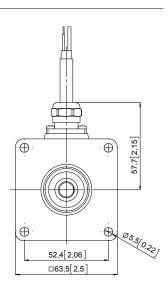
10 [0.39]

1/4"

3/8"







Fit

h7

f7

h8

h8



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Dimensions hollow shaft version

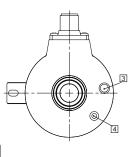
Dimensions in mm [inch]

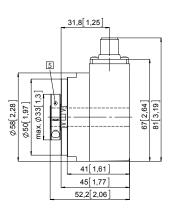
Flange with spring element, long Flange type 1 and 2

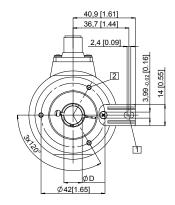
(drawing with M12 connector)

- Slot spring element, recommendation: torque pin DIN 7, ø 4 [0.16]
- 2 3 x M3, 5.5 [0.22] deep
- 3 Status-LED
- 4 SET button
- [5] Recommended torque for the clamping ring 0.6 Nm

D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7
3/8"	H7
1/2"	H7







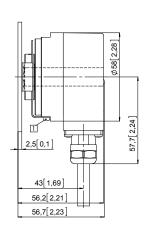
Flange with stator coupling, ø 65 [2.56] Flange type 3 and 4 $\,$

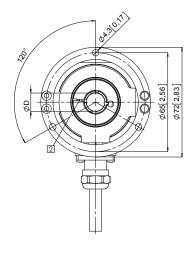
Pitch circle diameter for fixing screws 65 [2.56]

(drawing with cable)

- 1 Fixing screws DIN 912 M3 x 8 (washer included in delivery)
- 2 Recommended torque for the clamping ring 0.6 Nm

D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7
3/8"	H7
1/2"	H7





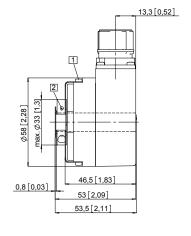
Flange with stator coupling, ø 63 [2.48] Flange type 5 and 6 $\,$

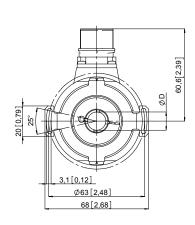
Pitch circle diameter for fixing screws 63 [2.48]

(drawing with M23 connector)

- 1 Fixing screws DIN 912 M3 x 8 (washer included in delivery)
- 2 Recommended torque for the clamping ring 0.6 Nm

D	Fit
10 [0.39]	H7
12 [0.47]	H7
14 [0.55]	H7
15 [0.59]	H7
3/8"	H7
1/2"	H7







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Dimensions hollow shaft version

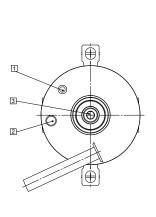
Dimensions in mm [inch]

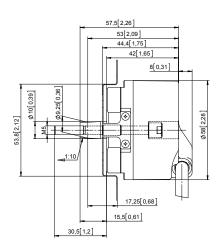
Flange with stator coupling, ø 72 [2.83]

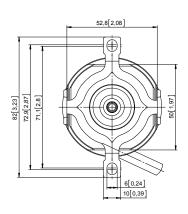
Flange type G

(with tapered shaft K and tangential cable)

- 1 Status LED
- 2 SET Button
- $\fbox{3}$ Recommended torque for (SW 4) tightening screw 3 $^{+0.5}$ Nm







Dimensions hollow shaft version

Dimensions in mm [inch]

Flange with expanding coupling, ø 65 [2.56"] Flange type H

- 1 Status-LED
- 2 SET button
- $\fbox{3}$ Recommended torque for (SW 4) tightening screw 3 $^{+0.5}$ Nm
- 4 Recommended torque for (SW 2) tightening screw 1 Nm

